Light and Lighting

Official Journal of the Illuminating Engineering Society.

Incorporating "The Illuminating Engineer."

32, Victoria St., London, S.W.1.

Edited by J. STEWART DOW

Telephone: ABBey 5215

Vol. XXXVIII.—No. 2 **February, 1945** PRICE NINEPENCE Subscription 10/6 per annum, post free

Life-saving Light

WE give elsewhere (p. 25) notes on several inventions—lights that have been the means of saving life at sea.

But these spectacular devices are only a few out of many. In everyday life—in the home, office, and factory, and in the streets—light, wisely used, saves life and diminishes jeopardy.

We have learned from the experience of the black-out how grievously enforced darkness has increased the risk of traffic fatalities on the roads by night—far too heavy even under pre-war conditions.

When people talk of "saving light," therefore, remember the other side. Fuel may be saved—certainly a consideration in such times as these—but make sure that in saving fuel we do not lose other things—health, safety, and efficiency.

There is, however, one form of saving that can always be practised—when light is being improperly and even dangerously used, and economy and improvement may go hand in hand.

Factory Lighting Regulations

The newly formed I.E.S. Halifax Group, at its recent meeting on January 30, had an opportunity of hearing an address by Mr. H. W. Murray on "Factory Lighting Regulations." Mr. Murray, as one of the Senior Inspectors of Factories as well as an I.E.S. member of long standing, was an excellent choice, and he explained all the legal requirements of the Order clearly by the aid of numerous illustrations. Reference was also made to the I.E.S. Code. The lecturer emphasised the definite moral obligation to provide efficient illumination, and quoted instances, based on war experience, in which outstanding good results had been obtained. The honorary secretary of the Group is Mr. H. W. Lodge (Public Lighting Department, Mulcture-road, Halifax), who will be glad to hear from intending members.

Light and Vision

The fourth meeting of the I.E.S. Edinburgh Group, also a recent formation, took place at the Heriot-Watt College, on January 17, when Mr. Norman G. Wilson, the chairman, presided, and Dr. H. E. Seiler gave an address on "Light and Vision." Dr. Seiler gave a full description of the mechanism of the eye, its defects and means of overcoming them, and also dealt at length with effects of light, emphasising the value of good lighting in alleviating eyestrain, and the importance of avoiding such defects as direct and reflected glare—instances of which occur in both natural and artificial lighting. After a good discussion, a vote of thanks was moved by Mr. W. C. Parrott. We notice that at the subsequent meeting of the Group, announced for March 2, Mr. J. M. Waldram was down to give a talk on street lighting. The honorary secretary of this Group is Mr. S. G. Batt (8, George-street, Edinburgh), who will likewise be pleased to hear from prospective members.

I.E.S. in America

The annual report of the American I.E.S. (*Illuminating Engineering*, December, 1944) contains much interesting statistical information. A comparison of the graph showing growth in membership year by year with that given recently by Mr. Stroud for the British Society (*Trans. Illum. Eng. Soc.* (*Lond.*), October, 1944, p. 163) shows a striking similarity. In both cases a period of rapid growth set in about 1933. In the U.S.A. the membership was roughly trebled (from 1,200 to 3,600) during 1933 to 1945; in this country the rate of growth was even higher, the number being nearly quadrupled. The sudden drop during 1931 to 1933, the result of the financial depression, in the American curve is not apparent in the British one; the effect was doubtless less acute, though it might have been evident had more accurate data been available for this period. In two other respects similar experience of the societies here and in America is evident. During the past two years the volume of material published in *Illuminating Engineering* shows a diminution. The American Society, like our own, has also experienced a larger (possibly temporary) surplus of income over revenue.

Forthcoming I.E.S. Meetings

(Provisional List)

SESSIONAL MEETINGS IN LONDON

1945.

March 21st. Mr. J. M. Waldram on **"Measurements of the Photometric Properties of the Upper Atmosphere,"** *(Joint Meeting with the Royal Meteorological Society, in the Large Physics Theatre of the Imperial College of Science, Imperial Institute Road, South Kensington.)* **5.30 p.m.**

MEETINGS OF CENTRES AND GROUPS

1945.

March 2nd. Address by The President. *(In the Pump Rooms, Bath.)* **7 p.m.**

March 2nd. Mr. J. M. Waldram on **Street Lighting.** *(At the Heriot-Watt College, Edinburgh.)*

March 2nd. Mr. W. Imrie Smith on **Lighting: The Industrial Lighting Engineer's Point of View.** *(In the Lecture Theatre of the City of Nottingham Gas Department, Parliament Street, Nottingham.)* **5.30 p.m.**

March 5th. Paper on **Neon Lighting.** *(In the Borough of Derby Electricity Showrooms, Irongate, Derby.)* **6 p.m.**

March 5th. Mr. T. S. Jones on **School Lighting.** *(In the Leeds Corporation Electricity Showrooms, The Headrow, Leeds.)* **6 p.m.**

March 5th. Mr. J. B. Carne on **The Avoidance of Excessive Glare.** *(In the Nether Chapel, Norfolk Street, Sheffield.)* **6 p.m.**

March 6th. Mr. L. G. Applebee on **Coloured and Directional Light as Applied to the Theatre.** *(In the Leicester Corporation Electricity Department, Demonstration Theatre, Charles Street, Leicester.)* **6 p.m.**

March 6th. Mr. K. Oldham on **Neon Signs.** *(In the Electricity Showrooms, Market Street, Huddersfield.)* **7 p.m.**

1945.

March 7th. Mr. C. S. Chubb on **Some Problems in Mine Lighting.** *(In the Minor Hall, Oxford Street, Newcastle-upon-Tyne.)* **5.30 p.m.**

March 8th. Dr. J. H. Nelson on **Vehicle Lighting.** *(In the Electricity Department Showrooms, Sunbridge Road, Bradford.)* **6.45 p.m.**

March 8th. Dr. S. English on **Street Lighting.** *(At the South Wales Institute of Engineers Lecture Theatre, Park Place, Cardiff.)* **3.30 p.m.**

March 8th. Short Papers. *(In the Reynolds Hall, College of Technology, Sackville Street, Manchester.)* **2.30 p.m.**

March 13th. Mr. W. J. Jones on **A Review of Light and Lighting Progress.** *(In the Lecture Theatre of the Corporation Electricity Showrooms, Whitechapel, Liverpool.)* **2.30 p.m.**

March 21st. Mr. T. J. Pickering on **The Prevention of Dazzle by Polarised Light.** *(In the Cleveland Scientific and Technical Institute.)* **6 p.m.**

March 23rd. Dr. W. D. Wright on **Some Visual Problems for Illuminating Engineers.** *(At the Imperial Hotel, Temple Street, Birmingham.)* **5.30 p.m.**

Other Forthcoming Events

The attention of I.E.S. Members is drawn to the following forthcoming meetings, to which they are cordially invited:—

1945.

March 6th. Mr. Wilfred Lund on **Possible Improvements in the Lighting of Automobiles and Public Service Vehicles.** *(Meeting of the Institution of Automobile Engineers, at the Institution of Mechanical Engineers, Storey's Gate, St. James's Park, Westminster.)* **5.30 p.m.**

April 12th. Mr. R. O. Ackerley on **Factors Influencing the Design of Electric Lighting Installations for Building Interiors.** *(Installation Section Meeting of the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, London, W.C.2.)* **5.30 p.m.**

(Secretaries of Centres and Groups are requested to send in particulars of any changes in programmes, mentioning subject, author, place, date and time of meeting; summaries of proceedings at meetings (which should not exceed about 250-500 words) and any other local news are also welcome.)

The Lighting of Buildings

The I.E.S. lost no time after the appearance of the D.S.I.R. Report on The Lighting of Public Buildings in arranging for a discussion, which took place at a meeting held in London on February 13. They were very fortunate in inducing Dr. C. C. Paterson, the chairman of the committee, to present this comprehensive document; he was followed by Mr. P. V. Burnett and Mr. R. O. Ackerley who dealt respectively with the work of the sub-committees on natural and artificial lighting.

The meeting certainly served one good purpose—that of making this report familiar to a number of I.E.S. members who had not previously seen it, though many of them doubtless had read the summary that appeared in our last issue (January, 1945, pp. 5-8). It was a disadvantage, however, that so many of those present had not studied the full report and the time available proved to be all too short for the full discussion of such a bulky production. The discussion was opened by Mr. J. S. Dow, who compared the figures with those of some early I.E.S. committees, and remarked on the manner in which natural and artificial lighting had been handled together. This point was taken up by other speakers. Mr. P. J. Waldram commented at length on the section of the report dealing with natural lighting. A number of speakers discussed the use of artificial lighting to supplement daylight—obviously a point of great interest to the lighting industry. A very pleasing and unexpected item was the presence at this meeting of Dr. N. A. Halbertsma, last met by many of those present at the gathering of the I.C.I. in Holland shortly before the outbreak of war, who was given a warm welcome. Dr. Halbertsma referred briefly to the trials and privations suffered in Holland and the shifts to which people there had been put to obtain even a glimmer of artificial light in their homes. Let us hope that the amelioration of these conditions is not now far distant.

The Physics of Gas Lighting

It is not often that the I.E.S. has an opportunity of hearing something of the principles underlying the theory of gas lighting. A very welcome paper on this subject was recently read by Mr. F. C. Smith, first before the Glasgow Centre on January 19 and subsequently before the Leeds Centre on February 5. The paper fell broadly into two parts, the first concerned with the physics of light production, the second with the theory of the design of gasburners, and the allied questions of composition and calorific power of gas, flame temperature and aeration, etc. The discussion of thermal radiation followed familiar lines, the lecturer recalling the theoretical efficiency of 624 lumens per watt attainable for monochromatic greenish yellow light and 250 lumens per watt for white light of 100 per cent. efficiency. Mr. Smith quoted Mr. Aldington in support of the contention that although fluorescent light sources have great advantages the day of the source dependent mainly on thermal radiation is by no means over. The paper was instructive in showing what a large margin for development still exists in gas lighting. At both Centres general appreciation of the value of this paper was expressed, the vote of thanks being moved by Mr. M. W. Hime, in Glasgow, and by Mr. J. G. Craven, in Leeds.

Removal of Restrictions on Automobile Headlights

Following the alleviation of the blackout comes the announcement that wartime restrictions on motor automobile headlights are to be removed. The restrictions were imposed mainly from A.R.P. considerations, but, in spite of the evident dangers of the curtailed beam, were considered of some benefit in reducing excessive glare in darkened streets. The removal of restrictions will doubtless be hailed with relief by drivers; whether pedestrians will derive equal benefit remains to be seen. They should, however, become much more evident objects in the stronger light of the lengthened beam, and if they do find the glare excessive may take comfort from Dr. J. H. Nelson's recent dictim, "It is better to be dazzled than dead."

American I.E.S. Appoints Technical Secretary

We referred recently to the appointment, by the Illuminating Engineering Society in the United States, of a new Executive Secretary, Mr. A. D. Hinckley, to fill the vacancy caused by the resignation of Mr. F. G. Horton —who had served in this capacity for over 20 years. We also drew attention to a new departure, the proposed appointment of a supplementary "Technical Secretary" to deal with technical and research activities. This position has now been filled by the appointment of Mr. C. L. Crouch, who will act as consultant to the various technical committees and to the Council. Besides this work, which will doubtless cover a wide field, he will be concerned with the production of the forthcoming I.E.S. Illumination Design Handbook, the preparation of which is already being explored by a special committee. The appointment of this new expert, in addition to the existing secretarial staff, illustrates the demands made by increasing activities—of which the I.E.S. in this country is also well aware.

Selection and Training for Industry

An informative discussion on "The Selection and Training of Personnel for Industry" was recently organised by the Institute of Physics, when the opening speaker, Major F. A. Freeth, of Imperial Chemical Industries, made some very helpful suggestions for the training of scientists for industry and showed a sympathetic insight into the needs of those who suffered from educational drawbacks—perhaps owing to war conditions—and needed encouragement. Important points were a man's general intelligence and the possibility of his development over a long period in the right atmosphere. People who did well in examinations were industrious and might very well have brains; yet men whose performances in examinations had been poor should not be overlooked. A man's education should serve the main purpose of "getting him into a frame of mind where he will go on building for himself for the rest of his life." (At the other end of the scale is the man who, on obtaining his degree, says, "I'm qualified," and potters along till he reaches his grave.) Major Freeth deprecated the idea that a man was a kind of *doctor mirabilis* when he had graduated. Like many other authorities on this subject he pleaded strongly for more training in the writing of clear English. Others who spoke emphasised the need for a wide knowledge rather than a specialised one, the value of contact with industry, and the demand for new blood in industry which was organic and continually changing. A not uncommon attitude in these days was that of one new graduate who complained that he did not like working for other people's profit—and had to be reminded that he was, in fact, working for other people's loss!

D

Street Lighting; Prospect and Retrospect

In what follows we give a summary of the paper read to the Tees-side I.E.S. Group by Mr. James A. Mitchell at a meeting held in Middlesbrough on January 17th, 1945.

The address given by Mr. James M. A. Mitchell, a past president of the Newcastle Centre, to the I.E.S. Tees-side Group on January 17 was stated by him to be "a review of general technical interest rather than a technical dissertation." It certainly constituted an excellent general survey of the subject, enlightened by occasional references to the human element—always in evidence in illuminating engineering.

Mr. Dalby presided and introduced Mr. Lennox, the present chairman of the Newcastle Centre, who had taken the opportunity of paying a neighbourly and much appreciated visit to this recently formed Group.

In his opening remarks Mr. Mitchell referred to experiences during the past six years, when no progress towards higher standards or better technique has been possible. Little could be done even to save existing equipment from deterioration; weather, wilful damage, and neglect have taken a heavy toll. Proposals by salvage enthusiasts to uproot idle lamp-posts for scrap have had to be tactfully resisted. Warning has been given that materials and labour will not be available for a long time to come.

Lessons of the Black-Out

After this rather doleful opening, Mr. Mitchell proceeded to explore the prospect of some brightness in the future, based on useful lessons learned in the black-out and the dim-out. He remarked that street lighting had probably excited more discussion and controversy than any other field of illuminating engineering. The area of lighted streets often exceeds the area covered by the houses which they serve, and the hours during which they are lit are certainly greater. Yet the consumption of energy is very much less. The problems involved are peculiar to street lighting. In many cases we light, not the object to be seen, but the background against which (we hope) it will be seen Dangerous parts of "street works in progress" are, in daylight, roped off, and this rope is only effective because the road-user can see it. At night he can no longer do so, and a row of hurricane lamps is substituted.

The fundamentals of street lighting may appear simple, but they are not really so. It may be said that daylight, even on a dull day, is adequate. Therefore, reproduce it approximately as we aim to do indoors! Daylight illumination, however, is much greater in a street than in a room. The distances and the speed at which we wish to identify objects are much greater and (alas!) many of the objects are moving much faster. On the other hand, fine detail need not be readily visible. If we take 2 ft.c. as the average illumination needed for free and safe movement indoors, and apply this to the streets, a little calculation shows that for 10,500 sq. ft. between spans, 21,000 lumens are necessary (as compared with 900-3,750 lumens per lantern in the M.O.T. Report). There would be 35 of these spans per mile, requiring 735,000 lumens, say, 735 100-w. lamps. Now a mile of road will accommodate 350 small semi-detached houses with an average frontage of 30 ft. Street lighting on this scale would thus be equivalent to two 100-w. lamps per house—not so ridiculous when it is recalled that many people have, or had, one lamp in the porch and one over the garage door. The average all-in domestic cost might be of the order of 2s. 6d. per house per week. This very rough calculation shows that lighting up to Class "A" in the B.S.I. specification should not be regarded as wildly extravagant. Incidentally, the average product of a 1d. rate in Tyneside is about 2s. per family.

Influence of Sources of Light

In the next section of his paper Mr. Mitchell looked back to the early days when citizens were required to hang a lantern containing one candle outside their doors—and did not do so badly. In fact, the lighting of those days suited the conditions of the age better than the 0.02 lighting suits modern conditions. The organised street lighting which followed ("beacon lighting") may be compared with the 0.0002 "star lighting."

Mr. Mitchell also traced the increase in the scale and extent of street lighting with the coming of gas, alluding to the pioneering work in the design of flat

(Continued on page 23.)

flame and Argand burners by William Sugg, George Bray, and others. Attention was devoted first to improving the light source, secondly to the lantern, and finally to the distribution, a sequence which prevailed more or less until the present day. The studied siting of lamps is, however, a modern development. A single burner of those days gave somewhat more than "modified lighting" at 10 ft. from the post and "star lighting" at mid-span. Lanterns contained clusters of burners and worked at a gas rate per hour higher than that of to-day. Some were fine examples of metal work and glazing and of artistic design; good specimens may still be seen in use in London to-day.

The invention of the upright incandescent mantle required that greater attention should be given to weatherproofing the lantern, and to means of ignition; the pilot light, pressure wave controllers, and clock controllers were soon evolved.

Part-Lighting in Early Hours

From quite early days arrangements had been made to turn off all but one of a cluster of burners at midnight. More perfect control and more powerful sources make possible either the shutting-off of one burner in a multiple burner lamp, or of every alternate lamp, at a determined time. The M.O.T. Committee recommended that lighting should invariably continue from dusk to dawn. It may be urged, however, that if 50 per cent. of lamps are cut off when least needed, more can be available for the most important period. On the other hand, capital expenditure per burner is greater and maintenance costs only slightly reduced. If lamps are side-mounted and opposite to each other extinction of alternate lamps gives rise to a staggered formation and the spacing height ratio is not affected; but if they are already staggered we must either extinguish all lamps on one side (an undesirable method) or accept an irregular formation.

The inverted mantle, giving the greater part of the light output in the lower hemisphere and the superheated cluster burner led to further gains in efficiency. The carbon filament electric lamp had apparently little effect on street lighting, but the introduction of arc lamps led to greater heights and the consideration of raising and lowering gear. Objection was taken to the sharp shadows and this led to the use of diffusing glassware, now commonly adopted but originally criticised on the ground that it "wasted the light." Since then electric light sources have greatly improved in efficiency by the invention of the tungsten filament lamp and that wonderful example of applied atomic physics—the electric discharge lamp.

Standard Specification.

In most fields of illuminating engineering the quality of an installation is affected by many variable factors to which, in some cases, it is not yet possible to assign numerical values ("glare" is a case in point). The bases of a standard specification are definition, measurement, and test—the latter by comparison with an agreed and reproduceable standard. In view of the difficulties mentioned above, no entirely satisfactory standard specification or code of practice for street lighting has yet been evolved. The first attempt, the B.S.I. specification of 1927, was revised in 1931 and a committee was engaged on a further revision when war broke out. This Committee has now resumed its labours.

Mr. Mitchell briefly referred to the difficulties of photometry, when applied to street lighting, and to the question whether horizontal illumination (as specified in the original B.S.I. specification) or vertical illumination should be measured. A test in a vertical plane rather presumes that the object is lighted from behind one, but if the object is beyond the mid-span one is dependent on the object's contrast with its background and horizontal illumination becomes the more important. In relation to vertical illumination the cosine law has a minimum effect at mid-span and a maximum immediately under the lamp (this has been practically demonstrated by putting a single lamp above a policeman on point duty; in certain circumstances he may become invisible and lamps with large umbrella-like shades have been adopted to get over the difficulty). In relation to horizontal illumination the cosine law has the reverse effect and has a maximum influence at mid-span, increasing reflection from the road surface and providing a light background. This is doubtless an economical and efficient way of using a small flux of light to enable a driver to see if he has a clear path. But it does not necessarily provide all that is required for good street lighting. Before the war great importance was attached to the lighting of the "traffic lane," to the partial exclusion of other factors which also contribute to safety on the roads, and to the almost complete

neglect of the amenity and aesthetic value of street lighting.

"Amenity Lighting."

This "amenity value" also contributes to street safety, largely because it inspires confidence. This effect is not taken into consideration by a specification of street lighting which can scarcely attempt to cover the whole ground. It is not a manual of good street lighting and might usefully be supplemented by a "Code of Good Practice." The specification must, however, furnish the basis of such a Code. The original specification was based upon a classification of installations in terms of illumination at test points and the corresponding heights of light sources. The specification also laid down methods of testing illumination, but, in the 1931 edition, abandoned any attempt to evaluate glare, merely stating that glare can be reduced by decreasing the spacing and increasing the height of light sources—a statement to be taken in conjunction with the recommendations in regard to spacing/height ratio for the various classes, i.e., the candlepowers of the lamps employed. It is at variance with the modern tendency to erect high-power lamps on long spacing. The 1931 report was also largely instrumental in popularising the useful sinusoidal isocandle diagram.

War Time Street Lighting.

Mr. Mitchell next alluded to the specication for war time street lighting (BS/ARP.37 of 1940), explaining the exceptional conditions to be met and the reasons for the special characteristics of fittings and polar curves—the outcome of some first-class experimental work by the Committee and the makers. This specification, however, passes into limbo with other "black-out" regulations.

When "modified" lighting was introduced last September a maximum of 0.02 ft.c. was allowed—an illumination which required only about 6 c.p. from a source immediately overhead and 17½ ft. high, but nearly 300 c.p. at a distance of 60 ft. away from a source so mounted. Exact uniformity could not readily be obtained but compromises were adopted ensuring a reasonable absence of dark patches with all the lamps lighted. Owing to the low general illumination there is, however, danger of glare to the motor driver in some situations.

The Future Outlook.

In conclusion, Mr. Mitchell asked what will be the effect of the black-out interval and the public's experience of modified lighting upon the prospects of public lighting in the future? In spite of their complaints of the discomfort of the black-out the public has been apathetic in regard to the preservation of existing installations in good condition and the need for preparations for the future. Several years elapsed after the last war before the number of lamps in use equalled that in 1914. There is a danger that history may repeat itself. Too much reliance should not be placed upon improved technique or more efficient light sources. The dominant consideration in the past has been the desire to make a little money go a long way. Will we be able to afford improved lighting? Will the public want it and if so will they be willing to pay for it? The public may feel the need for it without realising that they want it, or without knowing that it is possible for them to get it. They may even be willing to pay for it if a method of payment agreeable to them can be devised.

Discussion.

The discussion was opened by Mr. E. C. Lennox who emphasised the need for a new edition of the British Standard Specification for Street Lighting, supplemented by a "Code of Practice." It was conceded that amenity value of street lighting should not be ignored, but it was pointed out that attention must necessarily be concentrated on the problems involved in lighting the "traffic lanes"—especially in view of the unduly high proportion of road accidents suffered at night, which for some time had been a dominant feature of accident statistics.

Fluorescent Lamps: The Trend of Development

The second meeting of the newly formed I.E.S. Liverpool Group was, we hear, a great success. Over 100 were present to hear a paper on the above subject by Mr. H. R. Ruff. Mr. K. R. Mackley, the honorary secretary of the Group, reports that the discussion (which occupied almost as much time as the address) was an excellent one. Mr. Darlington, the chairman of the Group, presided, and a vote of thanks to the lecturer was proposed by Mr. J. Eccles, the City Electrical Engineer, and seconded by Mr. Colin Grant.

At the next meeting of the Group, on March 13, a paper reviewing lighting progress is to be given by Mr. W. J. Jones.

Fluorescent Lighting in a Birmingham Engineering Works

The picture shows part of an inspection department, where close inspection, both visual and by means of gauges, is carried out on bright parts. Lighting by sources of low brightness is therefore essential and is secured by the use of fluorescent (Mazda) 80 w. lamps in open type reflectors. The picture also shows how well the "tunnel effect" has been avoided. The installation was carried out by Arthur Ellis (Electrical) Ltd., of Birmingham.

Life-saving Lights

We notice in the *I.E.S. Lighting Review* (Australia) references to several forms of lights for use in emergency at sea, which have come into being since the outbreak of war and have doubtless been the means of saving many lives.

The first of these is a small 6-watt "walnut sized" searchlight mounted in a waterproof housing which now forms part of the equipment of the self-inflating rafts carried by ocean-flying military planes and serves to guide rescuers over the last dozen or so critical miles. It is worn on a head band, leaving both hands free. This is wired to a small hand-cranked generator that gives power to the radio transmitter and, by means of a make-and-break switch can be keyed for visual signals. This little device that needs no lens, projects a 1,500 c.p. beam with a theoretical range of 60 miles.

The second device is the "little red light," a waterproof lamp weighing less than 8 oz. and giving 20 hours' light, now worn on life-jackets by those in the merchant marine service. Before this light was available rescue ships, fearing to show their own lights, often had the greatest difficulty in locating survivors of torpedoed vessels. Now the display of these lights makes the sea like a "field of flowers." Each survivor is identified—but the lamp has a knock-out switch for instantaneous use in case of enemy machine gunning.

The invention is ascribed to Charles William Wood, a civil servant and former merchant seaman, to whom the idea was suggested by a bus-conductor using a shielded light attached to his coat-lapel when giving out change.

Post-War Lighting

By RICHARD FREETH

In what follows we give a summary of the short talk recently recorded by Mr. Richard Freeth, and broadcast to the European Service of the B.B.C. on the morning of February 2, 1945. Mr. Freeth is associated with the E.L.M.A. Lighting Service Bureau.

From a black-out, more prolonged and probably more intense than in any other part of the world, this country is, at last, gradually emerging into the light.

It's a wonderful feeling although, at present, you don't notice much more than a few glowing windows and streets have only a very poor reflection of their pre-war brilliance.

Actually, however, the war and the black-out have done a lot to make people more appreciative of good lighting. The Government very early on realised that it affected war production and brought in compulsory minimum standards in factories, and many who never had it before have seen that good lighting can help them to do jobs more quickly and efficiently.

Owners of shops, and shoppers, too, have realised what a difference restricted lighting can make—none of those gay signs and sparkling windows—and they're eagerly waiting to make the most of the newest methods just as soon as materials are available.

Ordinary homes are also likely to be much lighter. A special committee of the Ministry of Works has recommended that all houses built after the war shall be compulsorily equipped with proper facilities for good lighting. The same sort of thing is likely to be done for schools where lighting may have special automatic photo-cell control to switch it on, even during the day, whenever the daylight is insufficient.

The most outstanding thing of all in the lighting world has been the introduction of a new sort of tubular lamp using ultra-violet rays and fluorescent powders. This costs less to run than anything we've had before, and can give light ranging from daylight to the most rich and exciting colours. Pioneered in this country and widely developed by our American Allies in the days before Pearl Harbour, these lamps have already been used to create daylight conditions in thousands of war factories. There can be little doubt that they represent the lighting of the future.

Out-of-doors lighting—holiday resorts, historic buildings, parks and playing fields—that's expected to be a big feature of post-war Britain. Most of our lovely old buildings fade out after dark, and it is expected that many will be given attention by floodlighting experts to make them visible and even more beautiful by night than by day.

Before the war Blackpool, the great seaside resort of the North, was famous for its lights, but it will have to look to its laurels in the future to compete with similar towns all over the country which are already making plans for floodlit beaches and spectacular lighting displays.

Floodlit playing fields may become the rule rather than the exception, for it is realised that children must be kept off the streets after dark, and this is one way of doing it. Streets are for traffic and the plans are all ready for providing lighting that will make them safe and efficient at night.

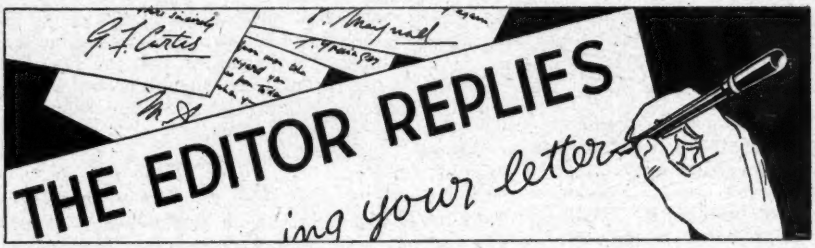
Yes, brighter nights are ahead. The Government, local authorities, safety first associations, town and country planning concerns, are all co-operating to make the whole country bright and safe after dark.

It will take time, of course, for the lighting industry has been, and still is to a large extent, engaged entirely on war production, but there is no doubt at all that when things are once more organised on a peace-time basis, Britain will be one of the best lighted countries in the world.

Obituary

R. G. BEUTTELL

We learn with great regret of the loss of Mr. R. G. Beuttell, who was attached to the R.A.F., and before the war was a student member of the I.E.S.—one of its most promising young members who took a keen interest in the work of the Society and did some very helpful voluntary secretarial work on committees. All I.E.S. members will join with us in expressing deep sympathy with his father, Mr. A. W. Beuttell., a past president and member of very long standing, and with Mrs. Beuttell who (as Miss Moreton) worked on the staff of the Society for many years.



A letter from our old friend, Mr. M. C. Toner, as usual full of ideas. He suggests that we should have a **"personal column"** about I.E.S. members. So we should and so we shall presently, but it is a little difficult to organise at present. He also refers to arrangements for getting **publicity for meetings of I.E.S. Centres and Groups** both in this journal and in the Press generally.

This is a point that has been increasingly brought to my notice during recent years. Our own arrangements are not very good, owing chiefly to paper restrictions, but in some cases Centres and Groups are to blame as they do not always furnish regular accounts of their meetings. I find that practice differs much in this respect. One point that has struck me forcibly is that it should be well worth while for every Centre and Group to appoint **someone to handle reports of meetings and "news" generally.** Secretaries have usually plenty to do without also taking this on.

Mr. Toner also refers to the **colour of light from fluorescent lamps,** mentioned in our last issue. The nature of **"warm white"** does need standardisation and the advantages of different tones of "white light," whether for general purposes, for decoration or for reading need to be explored. In this connection he suggests the desirability of **a special "fluorescent lighting" number**—another thing, however, which could be much better done a little later on, when the space problem has become less acute and manufacturers of lamps have more specific information available.

Another suggestion from Mr. Toner is that Dr. Walsh's famous contribution entitled **"Isocandles Simplified, or Onions Without Tears"** should again be reprinted. This suggestion will be kept in mind. A new generation of I.E.S. members have arrived since it originally appeared in *The Illuminating Engineer* (now *Light and Lighting*). In the meantime those interested may be referred to a recent issue of *Public Lighting* (April-June, 1944, p. 47) in which this contribution was reprinted, by special request.

I still not infrequently receive letters making inquiries in regard to **kerb lighting**, or some variant of it, in streets. Thus Dr. Geoffrey Lapage discusses this and other methods of "low level" effects, if necessary supplemented by special high level lighting to illuminate the faces of buildings, etc., which he suggests would save waste of light and help very materially to solve the glare problem.

It will be recalled that this idea was the subject of comment at an A.P.L.E. Conference in 1943. It is, I think, the belief of almost all public lighting engineers that in the immediate future street lighting will continue to be done mainly by pre-war methods. Although **low level lighting** at first sight seems attractive there are obvious difficulties in applying it on crowded public thoroughfares; whether it has a field

on less frequented by-roads, e.g., those round factories, etc., seems also doubtful.

Some of the methods suggested might perhaps be better described as **"lateral lighting,"** from the sides of streets. I believe fairly successful experiments have been made abroad on these lines (with lamps at the usual height, however), but they seem to depend essentially on illuminating objects on the highway rather than creating a silhouette effect. This procedure does certainly go some way towards avoiding glare troubles, but in practice would seem to be necessarily less economical than "longitudinal" lighting down the length of the street, which depends primarily on the creation of uniform brightness of the road surface.

The use of **artificial light to supplement natural lighting** is a subject now very frequently discussed. So, too, is the converse, i.e., when daylight is admitted into what was previously a completely blacked out factory. It is sometimes a disappointment that this entry of daylight does not lead to any substantial saving in power. Workers are loath to diminish the artificial lighting. It may happen that the admission of daylight leads to complaint of existing artificial lighting with which the workers were previously quite satisfied.

It is usually strong lighting in one particular region which, by contrast, makes artificial lighting appear dim, that causes dissatisfaction; indeed strong shafts of bright sunlight may be positively dangerous. It is very important, therefore, that entry of daylight should be widely distributed.

I have had some correspondence on the question of **supplementary illumination to prevent excessive contrast** between a strongly lighted working area and the background. In principle, admittedly, the contrast should not be too great. I have always considered, for example, that the showing of films in complete darkness is a mistake. On the other hand it is perhaps a counsel of perfection to require that the surrounding illumination should never be less than 1/10th of the working value, as I have heard advocated.

It does seem that on this particular point we lack definite physiological proof, and it must always be remembered that, provided the surroundings are light in colour, "stray light" may be very effective in revealing them. It is my own practice to read in bed by the aid of a simple bedside fitting, a 25w. pearl lamp inside a deep cardboard shade of the variety used for billiard tables. The strong and even reading illumination satisfies my needs, and I find that the light reflected from the book and white table cloth seems to show up the surroundings quite agreeably. Indeed, I find the conditions more restful than when general illumination in the room is also present though this may be partly psychological, as reading in bed is a leisurely and soporific process, and the mind is attuned to the surrounding low order of brightness.

Mr. W. Walters, one of the I.E.S. members in Manchester, draws attention to an evident need. In present circumstances it is difficult for members at a distance, who may be anxious to hear **papers read,** to attend meetings in London. Such papers ultimately find their way into the *Transactions*, but, owing to paper restrictions, a fair time may elapse between the dates of reading and publication.

I should explain that when papers are read, a limited number of **advance copies** in galley are usually prepared before the meeting—though manuscripts are not always received in time for this to be done. I should, however, always be pleased to hear from members who would like to see some particular paper, and would gladly furnish copies when available—as, indeed, is already not infrequently done.